Smart Building Center & Webex log in.

- WiFi Name: SBC_Office_Guest_2g
- Password: Oct0ber2015 (the 2nd “o” in Oct0ber2015 is a zero)

- Webex
- www.commerce.wa.gov/buildings
- Look for today’s agenda
  - Building Types, Bench-marking, and Standard 100 — Sections 5 & 7
  - 10 a.m. – 2 p.m. – Monday, Nov. 18 (Revised) (Please bring a brown bag lunch)
  - Registration (link)
  - Webex (link)

Department of Commerce

HB 1257 Pre-rulemaking

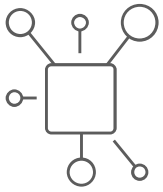
WORKSHOP 2

Buildings Team

11/18/2019

We strengthen communities

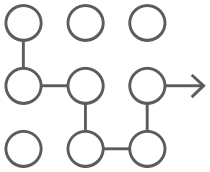
HOUSING / HOMELESSNESS



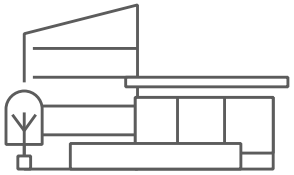
INFRASTRUCTURE

BUSINESS ASSISTANCE

ENERGY



PLANNING



COMMUNITY FACILITIES

CRIME VICTIMS / SAFETY

COMMUNITY SERVICE

Agenda

- Synthesis from workshop #1 – Nov. 8, 2019
- Workshop – outreach and engagement
- Presentation – building types
  - ASHRAE Standard 100 vs Portfolio Manager
- Lunch
- Presentation – building benchmarking and targets
  - ASHRAE Sections 5 & 7
- Workshop – building types, exempt buildings, spaces and activities

Disclaimer: Any comments we make today about specific rules are subject to change through the rulemaking process

Team Commerce

- Emily Salzberg — Managing Director, Buildings Program
- Chuck Murray — Policy Specialist and Technical Lead
- Austin Scharff — Energy Rules and Legislative Coordinator
- Paul Currington — Tech Support

- New staff – Anneka McDonald, Anna Batie

- Webpage: www.commerce.wa.gov/buildings
- Email: buildings@commerce.wa.gov

Associates

WSU Energy Program

- David Van Holde — Professional Engineer
- Karen Janowitz — Project Manager
- Jake Volkman — Energy Program Coordinator

SBW / 2050 INSTITUTE — EUI target setting

- Faith DeBolt
- Poppy Storm

Instructions for Commerce

RCW 19.27a.210

"In developing energy performance standards, the department shall seek to maximize reductions of greenhouse gas emissions from the building sector".

Clean buildings web page

- Workshop Schedules
- Agendas
- Meeting Minutes
- Meeting Recordings
- Meeting Presentations
- Draft rules

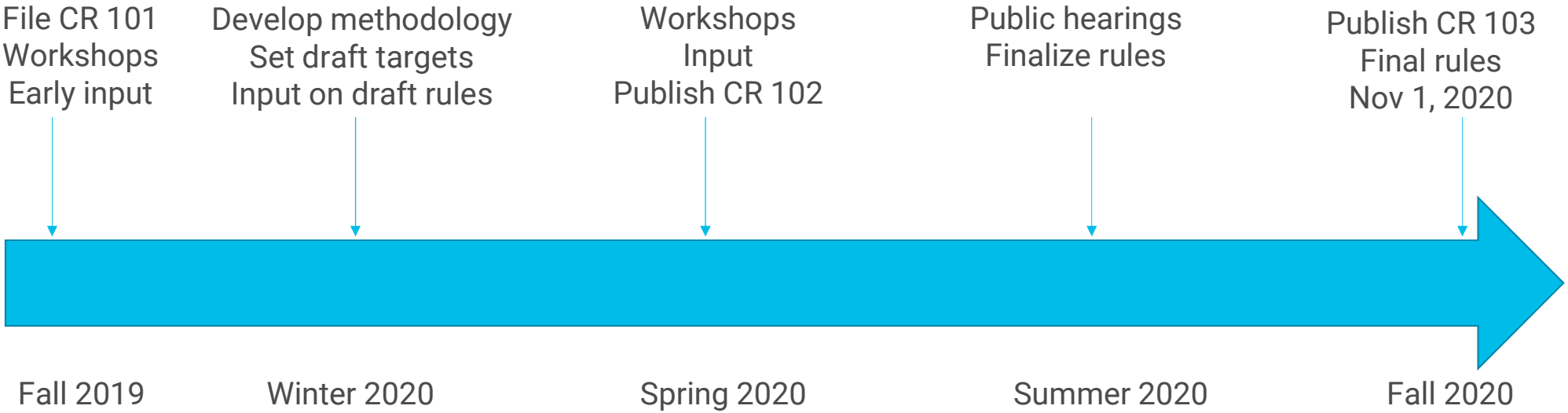
- Updated as we go
- www.commerce.wa.gov/buildings

Feedback from workshop 1 - discussions

Important topics identified:

- Building types and EUI targets
- Cost effective criteria
- incentives and financing
  - Administrative rules
  - Financing for small/medium buildings
  - Rural communities
- Alignment with other programs
- Carbon impacts and reductions r(elative to EUI targets)
- Outreach for rulemaking workshops

2019-2020 schedule



Technical Agenda

- Building Types
  - RCW 19.27a.210
    - STD 100
    - Energy Star Portfolio Manager
- Buildings Scope and Exceptions
  - RCW 19.27a.200 and 210
  - STD 100, Section 7
- Establishing a Building's Target (EUIt)
  - STD 100, Section 7

Building Types

Building Types

- (2) In establishing the standard under subsection (1) of this section, the department:
- (b) May consider building occupancy classifications from ANSI/ASHRAE/IES standard 100-2018 and the United States environmental protection agency's energy star portfolio manager when developing energy use intensity targets;

Energy Targets

- 7.1.1 Building Type. Buildings are divided into 53 types with activities as shown in Table 7-1
- 7.1.2 Energy Targets. Site-based energy targets are shown in Tables 7-2a
- As adjusted Table 7-3 Building Operating Shifts Normalization Factor

Table 7-1 Commercial and Residential Building Types/Activities

No.	Commercial Building Type	No.	Commercial Building Type
1	Admin/professional office	28	Preschool/daycare
2	Bank/other financial	29	Other classroom education
3	Government office	30	Fast food
4	Medical office (nondiagnostic)	31	Restaurant/cafeteria
5	Mixed-use office	32	Other food service
6	Other office	33	Hospital/inpatient health
7	Laboratory	34	Nursing home/assisted living
8	Distribution/ship center	35	Dormitory/fraternity/sorority
9	Nonrefrigerated warehouse	36	Hotel
10	Convenience store	37	Motel or inn
11	Convenience store + gas	38	Other lodging
12	Grocery/food market	39	Vehicle dealership/showroom
13	Other food sales	40	Retail store
[illegible]	[illegible]	[illegible]	[illegible]

	Table 7-2a Building Activity Site Energy Targets (EUIt1) (I-P Units)		
		Climate Zone	
		4c	5b
1	Admin/professional office	40	42
2	Bank/other financial	57	59
3	Government office	50	52
4	Medical office (nondiagnostic)	34	36
5	Mixed-use office	47	48
6	Other office	39	40
7	Laboratory	179	187
8	Distribution/shipping center	22	30
9	Nonrefrigerated warehouse	11	14
10	Convenience store	157	162
11	Convenience store with gas	126	130
12	Grocery/food market	131	135
13	Other food sales	40	41
14	Fire/police station	66	69
15	Other public order and safety	60	63
16	Medical office (diagnostic)	28	30

	Table 7-3 Building Operating Shifts Normalization Factor			
		Weekly Hours		
		50 or less	51-67	More Than 67
1	Admin/professional office	1.0	1.0	1.4
2	Bank/other financial	1.0	1.0	1.4
3	Government office	1.0	1.0	1.4
4	Medical office (nondiagnostic	1.0	1.0	1.4
5	Mixed-use office	1.0	1.0	1.4
6	Other office	1.0	1.0	1.4
7	Laboratory	1.0	1.0	1.0
8	Distribution/ship center	0.7	1.4	2.1
9	Nonrefrigerated warehouse	0.7	1.4	2.1
10	Convenience store	1.0	1.0	1.4
11	Convenience store and gas	1.0	1.0	1.4
12	Grocery/food market	1.0	1.0	1.4
13	Other food sales	1.0	1.0	1.4
14	Fire/police station	0.8	0.8	1.1
15	Other public order/safety	0.8	0.8	1.1
16	Medical office (diagnostic)	1.0	1.0	1.5

U.S. National Median Reference Values for All Portfolio Manager Property Types

Broad Category	Primary Function	Further Breakdown (where needed)	Source EUI (kBtu/ft²)	Site EUI (kBtu/ft²)	Reference Data Source - Peer Group Comparison
Banking/Financial Services	Bank Branch *		209.9	88.3	CBECS - Bank/Financial
	Financial Office*		116.4	52.9	CBECS - Office & Bank/Financial
Education	Adult Education		110.4	52.4	CBECS - Education
	College/University		180.6	84.3	CBECS - College/University
	K-12 School*		104.4	48.5	CBECS - Elementary/Middle & High School
	Pre-school/Daycare		131.5	64.8	CBECS - Preschool
	Vocational School		110.4	52.4	CBECS - Education
	Other - Education				
Entertainment/Public Assembly	Convention Center		109.6	56.1	CBECS - Social/Meeting
	Movie Theater		112.0	56.2	CBECS - Public Assembly
	Museum				
	Performing Arts				
		Bowling Alley			
		Fitness Center/Health Club/Gym			
		Ice/Curling Rink			

Building Types

- (2) In establishing the standard under subsection (1) of this section, the department:
- (b) May consider building occupancy classifications from ANSI/ASHRAE/IES standard 100-2018 and the United States environmental protection agency's energy star portfolio manager when developing energy use intensity targets;

  - Seems logical to align with Energy Star Portfolio Manager
    - already required by RCW 19.27a.170
  - Building types are also dependent on EUI target setting work
    - To some extent, building types will be enabled by this analysis
    - Not every building type will have a unique EUIt.

Buildings Scope, Exceptions

STD 100 Scope

- This standard applies to existing buildings, portions of buildings, and building complexes, including the envelope and all systems in the building. This standard excludes industrial and agricultural processes in buildings for which the energy targets do not include those processes.

RCW 19.27a.200 (7)

- (7) "Covered commercial building" means a building where the sum of nonresidential, hotel, motel, and dormitory floor areas exceeds fifty thousand gross square feet, excluding the parking garage area.

RCW 19.27a.210 (7)

- 7) The building owner of a covered commercial building must report the building owner's compliance with the standard to the department in accordance with the schedule established under subsection (8) of this section and every five years thereafter. For each reporting date, the building owner must submit documentation to demonstrate that:
- (a) The weather normalized energy use intensity of the covered commercial building measured in the previous calendar year is less than or equal to the energy use intensity target; or
- (b) The covered commercial building has received conditional compliance from the department based on energy efficiency actions prescribed by the standard; or

Building Exempted by RCW 19.27a.210

- (7) (c) The covered commercial building is exempt from the standard by demonstrating that the building meets one of the following criteria:
  - (i) The building did not have a certificate of occupancy or temporary certificate of occupancy for all twelve months of the calendar year prior to the building owner compliance schedule established under subsection (8) of this section;
  - (ii) The building did not have an average physical occupancy of at least fifty percent throughout the calendar year prior to the building owner compliance schedule established under subsection (8) of this section;

STD 100, 7.2.4 Energy Targets for Vacant and Partially Vacant Buildings

- 7.2.4.1 The energy target for a 100% vacant building shall be based on its prevacancy activity if the intended use of the building will be unchanged.
- 7.2.4.2 If the total floor area of a nonheated, noncooled, and nonilluminated vacant part of a building is smaller than 30% of the gross floor area , then it shall be excluded from the gross floor area, and the energy target shall be determined based on the remainder of the building as described in Section 7.2.3.
- 7.2.4.3 If the vacant part of a building is heated and/or cooled and the building energy-use data for a recent 12 consecutive month period when the building was occupied is not available, compliance of this part of the building will be determined after it becomes occupied and energy-use data become available for 12 consecutive months.

Building Exempted by RCW 19.27a.210

- (7) (c) (iii) The sum of the buildings gross floor area minus unconditioned and semiconditioned spaces, as defined in the Washington state energy code, is less than fifty thousand square feet;

WSEC

- CONDITIONED SPACE. An area, room or space that is enclosed within the building thermal envelope and that is directly heated or cooled or that is indirectly heated or cooled. Spaces are indirectly heated or cooled where they communicate through openings with conditioned spaces, where they are separated from conditioned spaces by uninsulated walls, floors or ceilings, or where they contain uninsulated ducts, piping or other sources of heating or cooling.
- SEMI-HEATED SPACE. An enclosed space within a building, including adjacent connected spaces separated by an uninsulated component (e.g., basements, utility rooms, garages, corridors), which:
  - 1. Is heated but not cooled, and has a maximum installed heating system output capacity of 3.4 Btu/(h-ft2) but not greater than 8 Btu/(h-ft2);
  - 2. Is not a walk-in or warehouse cooler or freezer space.
- UNCONDITIONED SPACE. Not defined by WSEC. Not one of the above.
  -

WSEC – may also be useful

- REFRIGERATED WAREHOUSE COOLER. An enclosed storage space that has a total chilled storage area of 3,000 square feet or greater and is designed to maintain a temperature of greater than 32°F but less than 55°F.
- REFRIGERATED WAREHOUSE FREEZER. An enclosed storage space that has a total chilled storage area of 3,000 ft2 and is designed to maintain temperatures at or below 32°F.

Building Exempted by RCW 19.27a.210

- (7) (c) (iv) The primary use of the building is manufacturing or other industrial purposes, as defined under the following use designations of the international building code: (A) Factory group F; or (B) high hazard group H;
  - *A building permit record, or evidence that it meets the building code definition*
    - https://codes.iccsafe.org/content/IBC2018/chapter-3-occupancy-classification-and-use
- (v) The building is an agricultural structure; or
  - RCW 10.27a.200
  - (1) "Agricultural structure" means a structure designed and constructed to house farm implements, hay, grain, poultry, livestock, or other horticultural products, and that is not a place used by the public or a place of human habitation or employment where agricultural products are processed, treated, or packaged.

STD 100 Energy Audit Scope

- 8.2.3 The following end uses are not included in this standard:
  - Industrial processes
  - Agricultural processes
  - Irrigation

Building Exempted by RCW 19.27a.210

- (7) (c) (vi) The building meets at least one of the following conditions of financial hardship:
  - (A) The building had arrears of property taxes or water or wastewater charges that resulted in the building's inclusion, within the prior two years, on a city's or county's annual tax lien sale list;
  - (B) the building has a court appointed receiver in control of the asset due to financial distress;
  - (C) the building is owned by a financial institution through default by a borrower;
  - (D) the building has been acquired by a deed in lieu of foreclosure within the previous twenty-four months;
  - (E) the building has a senior mortgage subject to a notice of default; or
  - (F) other conditions of financial hardship identified by the department by rule.

Establishing a Building's Target (EUIt)

7. ENERGY-USE ANALYSIS AND TARGET REQUIREMENTS

- 7.2.1 The energy manager (EM) or qualified person shall determine the energy target (EUIt) according to Section 7.2.2 for single-type/activity buildings and Section 7.2.3 for mixed use buildings

Table 7-2a Building Activity Site Energy Targets (EUIt1) (I-P Units)

		Climate Zone	
		4c	5b
1	Admin/professional office	40	42
2	Bank/other financial	57	59
3	Government office	50	52
4	Medical office (nondiagnostic)	34	36
5	Mixed-use office	47	48
6	Other office	39	40
7	Laboratory	179	187
8	Distribution/shipping center	22	30
9	Nonrefrigerated warehouse	11	14
10	Convenience store	157	162
11	Convenience store with gas	126	130
12	Grocery/food market	131	135
13	Other food sales	40	41
14	Fire/police station	66	69
15	Other public order and safety	60	63
16	Medical office (diagnostic)	28	30

Table 7-3 Building Operating Shifts Normalization Factor

		Weekly Hours		
		50 or less	51-67	More Than 67
1	Admin/professional office	1.0	1.0	1.4
2	Bank/other financial	1.0	1.0	1.4
3	Government office	1.0	1.0	1.4
4	Medical office (nondiagnostic	1.0	1.0	1.4
5	Mixed-use office	1.0	1.0	1.4
6	Other office	1.0	1.0	1.4
7	Laboratory	1.0	1.0	1.0
8	Distribution/ship center	0.7	1.4	2.1
9	Nonrefrigerated warehouse	0.7	1.4	2.1
10	Convenience store	1.0	1.0	1.4
11	Convenience store and gas	1.0	1.0	1.4
12	Grocery/food market	1.0	1.0	1.4
13	Other food sales	1.0	1.0	1.4
14	Fire/police station	0.8	0.8	1.1
15	Other public order/safety	0.8	0.8	1.1
16	Medical office (diagnostic)	1.0	1.0	1.5

7.2.2 Energy targets for buildings with a single activity

- (EUIt) = S × (EUIt1)

Table 7-2a (EUIt1)		Table 7-3 Operating Shifts			EUIt
	Climate		Weekly Hours		
	Zone	50	51-67	More	
	4C	or less		than 67	
Admin/professional office	40	1.0	1.0	1.4	40

7.2.3 Energy targets for buildings with multiple activities

- Step 1. For each occupancy type - (EUIt) = S × (EUIt1)

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt
	Climate		Weekly Hours		
	Zone	50	51-67	More	
	4C	or less		than 67	
Admin/professional office	40	1.0	1.0	1.4	40
Restaurant/cafeteria	156	0.4	1.1	2.1	327.6

7.2.3 Energy targets for buildings with multiple activities

- Step 2 Floor area weighting

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt	Floor Area Weighting	
	Climate Zone 4C	Weekly Hours 50 or less	51-67	More than 67		Area	%
Admin/professional office	40	1.0	1.0	1.4	40	280,000	0.93
Restaurant/cafeteria	156	0.4	1.1	2.1	327.6	22,000	0.07
						302,000	1

7.2.3 Energy targets for buildings with multiple activities

- Step 3 Develop area weighted EUIt
  - (EUIt = (A × S × EUIt1)1 + (A × S × EUIt1)2)n

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt	Floor Area		Weighted
	Climate		Weekly Hours			Weighting		EUIt
	Zone	50	51-67	More				
	4C	or less		than 67		Area	%	
Admin/professional office	40	1.0	1.0	1.4	40	280,000	0.93	37.1
Restaurant/cafeteria	156	0.4	1.1	2.1	327.6	22,000	0.07	23.9
						302,000	1	**61.0**

7.2.3 Energy targets for buildings with multiple activities

- Step 3 Develop area weighted EUIt
  - (EUIt = (A × S × EUIt1)1 + (A × S × EUIt1)2)n

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt	Floor Area		Weighted
	Climate		Weekly Hours			Weighting		EUIt
	Zone	50	51-67	More				
	4C	or less		than 67		Area	%	
Admin/professional office	40	1.0	1.0	1.4	40	280,000	0.93	37.1
Restaurant/cafeteria	156	0.4	1.1	2.1	327.6	22,000	0.07	23.9
						302,000	1	**61.0**

7.2.3 Energy targets for buildings with multiple activities

- Step 3 Develop area weighted EUIt
  - (EUIt = (A × S × EUIt1)1 + (A × S × EUIt1)2)n

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt	Floor Area		Weighted
	Climate	Weekly Hours				Weighting		EUIt
	Zone	50	51-67	More				
	4C	or less		than 67		Area	%	
Admin/professional office	40	1.0	1.0	1.4	40	247,000	0.82	32.7
Admin/professional office	40	1.0	1.0	1.4	56	33,000	0.11	6.1
Restaurant/cafeteria	156	0.4	1.1	2.1	327.6	22,000	0.07	23.9
						302,000	1	**62.7**

7.2.3 Energy targets for buildings with multiple activities

- Exceptions to 7.2.3:
  - 1. Spaces where more than 75% of the gross floor area has a unique building activity shall be reported as a single-use building or as a multiuse building in accordance with either Section 7.2.2 or Section 7.2.3.

7.2.3 Energy targets for buildings with multiple activities

- Exceptions to 7.2.3:
  - 1. Spaces where more than 75% of the gross floor area has a unique building activity shall be reported as a single-use building or as a multiuse building in accordance with either Section 7.2.2 or Section 7.2.3.

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt	Floor Area Weighting		Weighted EUIt
	Climate Zone 4C	Weekly Hours 50 or less	51-67	More than 67		Area	%	
Admin/professional office	40	1.0	1.0	1.4	40	280,000	0.93	37.1
Restaurant/cafeteria	156	0.4	1.1	2.1	327.6	22,000	0.07	23.9
						302,000	1	**61.0**

7.2.3 Energy targets for buildings with multiple activities

- Exceptions to 7.2.3:
  - 1. Spaces where more than 75% of the gross floor area has a unique building activity shall be reported as a single-use building or as a multiuse building in accordance with either Section 7.2.2 or Section 7.2.3.

	Table 7-2a (EUIt1)	Table 7-3 Operating Shifts			EUIt	Floor Area		Weighted
	Climate		Weekly Hours			Weighting		EUIt
	Zone	50	51-67	More				
	4C	or less		than 67		Area	%	
Hospital/inpatient health	135	1.0	1.0	1.0	135	229,520	0.76	102.6
Admin/professional office	40	1.0	1.0	1.4	40	72,480	0.24	9.6
						302,000	1	**112.2**

Exceptions to 7.2.3:

- 2. Spaces less than 10% of the gross floor area with a unique building activity can combine their floor area with the floor area within the building that has a similar building activity as determined by the EM or other qualified person.

- *Define boundaries for ‘‘similar’’?*

Exceptions to 7.2.3:

Up to 10% of a building may be a building type that is not listed if separately metered.

3. Spaces in *buildings* with multiple activities that are not listed in Table 7-1 and have a total combined area $\sum A_{nontarget}$ comprising less than 10% of the *building* gross floor area A_{gross} can be excluded from *building energy target* calculations if the energy use of such space is metered separately. The *energy target* for the remaining part of the *building* shall be calculated after deducting the unlisted *building* type floor area from the *building* gross floor area ($A_{gross} - \sum Anontarget$).

- *Reminder: if a building does not have a target, it must meet sections 8&9*

Exceptions to 7.2.3:

- 4. Spaces in multiple-activities buildings, with activities not listed in Table 7-1, comprising more than 10% but not more than 50% of the gross floor area shall comply with either Section 7.2.3, Exception 3, or Sections 4.1, 4.2, 4.3.1, and 4.3.3

  - 4.3.3 Buildings without Energy Targets
    - Must comply with sections 8 and 9

RCW 19.27a.210 - Unique

- (2) In establishing the standard under subsection (1) of this section, the department:
- (a) Must develop energy use intensity targets that are no greater than the average energy use intensity for the covered commercial building occupancy type with adjustments for unique energy using features. The department must also develop energy use intensity targets for additional property types eligible for incentives in RCW 19.27A.220. The department must consider regional and local building energy utilization data, such as existing energy star benchmarking data, in establishing targets for the standard. Energy use intensity targets must be developed for two or more climate zones and be representative of energy use in a normal weather year;

Examples of Comments Received

- "Offices vary greatly, and one of the largest impacts is plug loads based on FTEs. More FTEs/SF is better for the environment but adversely impacts a building's EUI. Can a building's FTE count be counted in as a multiplier for office space?"

- "There should be exceptions or allowances for buildings that have year-round or daily use that is atypical for that land use type, such as schools that hold evening, weekend, or summer events."

Examples of Comments Received

"Specific sub-uses should be considered. Here are a few examples:

- Kitchens in fire stations or dormitories;
- Restaurants with cold prep (sushi) vs intensive methods (deep frying);
- Grocery stores that sell all food types vs. dry shelf items only; and
- Server rooms in office buildings – these are energy-intensive, but exist off-site (less efficient for the world, but lower EUI for the office building itself) when economically driven out of the building."

Examples of Comments Received

- “Every single building is unique, whether by virtue of its age, location, usage type, shell and core architecture, mechanical systems, interior design or any combination or offshoot of the above”
- “Several examples of unique building uses were provided during our recent meeting on why more, not less, building types is better. Using Energy Star because it’s convenient will likely result in lots of exceptions or buildings with unrealistically high targets.”

Sub Committees Ideas

- Buildings without full metering
- Commerce/Utility incentive administration

- Others?